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Licensee:	Southern Nuclear Operating Company, Inc.
Facility:	Vogtle Electric Generating Plant (VEGP) Units 1 and 2
Location:	7821 River Road Waynesboro, GA 30830
Dates:	January 26 - 30, 1998
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EXECUTIVE SUMMARY

Vogtle Electric Generating Plant Units 1 and 2
NRC Inspection Report 50-424/98-01, 50-425/98-01

This inspection included a review of the licensee's implementation of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" [the Maintenance Rule]. The report covers a one-week period of inspection.

- Overall, the inspection team concluded that the licensee had a Maintenance Rule program that met the requirements of 10 CFR 50.65, and the program was being effectively implemented. However, implementing procedures lacked details in a number of areas. Based on this detail deficiency in the written program, the team determined that effective implementation of the program was heavily dependant upon the experienced personnel being involved in its implementation.

Operations

- Licensed operators, in general, understood their specific duties and responsibilities for implementing the Maintenance Rule. (Section O4.1)

Maintenance

- Required structures, systems, and components (SSCs) were included within the scope of the licensee's program. (Section M1.1)
- The licensee plans for performing periodic evaluations and assessments met the requirements of the Maintenance Rule. (Section M1.3)
- The procedure covering the periodic assessments was vague and did not provide details in the areas of: (1) review of effectiveness of corrective actions and (2) optimizing availability and reliability for SSCs. (Section M1.3)
- The licensee's approach to balancing reliability and unavailability met the intent of paragraph (a)(3) of the Rule. (Section M1.4)
- Procedures were weak in that they did not contain sufficient detail to clearly describe the requirements for balancing reliability and unavailability for risk-significant SSCs. (Section M1.4)
- The licensee considered safety in establishment of goals and monitoring for the (a)(1) systems and components reviewed. Also, corrective actions, goals, and monitoring were generally adequate for the (a)(1) SSCs reviewed. (Section M1.6)
- The goal to verify that the nuclear service cooling water (NSCW) system did not leak at the end of the reckoning period was not totally adequate in that it would not ensure the absence of additional pipe cracking. (Section M1.6)

- In general, for (a)(1) SSCs, operating experience was being properly captured, and industry-wide operating experience was considered, as appropriate. (Section M1.6)

- For (a)(2) SSCs, performance criteria had been established, suitable trending had been performed, and corrective actions were taken when SSCs failed to meet performance criteria or experienced failures. (Section M1.7)

- For (a)(2) SSCs, industry-wide operating experience had been considered, where practical, and operating data had been properly captured. (Section M1.7)

- A lack of detail was identified in the procedures for structural monitoring and for how unavailability was determined. (Section M1.7)

- In general, plant material condition and housekeeping observed during walkdowns were good. Preservation of equipment by painting was considered to be good. (Section M2.1)

- Based on the items identified in a 1997 audit and a self-assessment the team concluded, that a 1996 audit was not as thorough as it could have been. The 1997 audit was detailed and thorough, but some problems still existed as identified by the team. In general, corrective actions were taken for audit findings. (Section M7.1)

Engineering

- The licensee's approach for risk-ranking for the Maintenance Rule was adequate. (Section M1.2)

- The current method of assuring that the assumptions for availability in the probabilistic risk assessment (PRA) are conserved was adequate, but the PRA insights from the sensitivity study on availability were missing from the expert panel discussions. (Section M1.2)

- A sensitivity analysis had not been performed to determine if reliability criteria were conserving the assumptions in the PRA, but studies were in progress at the end of the inspection. (Section M1.2)

- The approach, under paragraph (a)(3) of the Rule, for assessing the risk-impact to maintenance activities was good. (Section M1.5)

- The licensee's process for ensuring that critical safety functions were available during planned outages was adequate. (Section M1.5)

- The overall approach for assessing the risk-impact of maintenance activities was considered adequate. (Section M1.5)

- Generally, system engineers were very knowledgeable of their systems, were proactive in corrective actions, and understood specific requirements of the Maintenance Rule. Effective integration of assigned

systems engineers in the process for implementation of the Rule was viewed as a major contributing factor to the program effectiveness noted during this inspection. System engineering contribution to implementation of the Maintenance Rule was considered to be a strength. (Section E4.1)

- The lack of check or oversight of the system engineer's decisions relative to functional failure calls was considered to be a procedural weakness. (Section E4.1)

Report Details

Summary of Plant Status

Both Vogtle units operated at power during the inspection period.

Introduction

The primary focus of this inspection was to verify that the licensee had implemented a maintenance monitoring program which met the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," (the Maintenance Rule). The inspection was performed by a team of inspectors that included a Team Leader, three Region II Inspectors, one Region II Senior Reactor Analyst, and two Resident Inspectors. In addition, NRC staff support was provided by a Senior Reactor Operations Engineer from the Quality Assurance and Maintenance Branch, Office of Nuclear Reactor Regulation (NRR). The licensee provided an overview presentation of the program to the team on the first day of the inspection. The overview handout is included as Attachment 1 to this report.

I. OPERATIONS

O4 Operator Knowledge and Performance

O4.1 Operator Knowledge of Maintenance Rule

a. Inspection Scope (62706)

Prior to the onsite portion of the inspection, the team reviewed six months of shift logs and limiting condition for operation (LCO) logs. During the onsite portion of the inspection, the team interviewed four licensed operators involved in on-shift work coordination duties to determine if they understood the general requirements of the Maintenance Rule and their particular duties and responsibilities for its implementation. Two were involved in senior reactor operator (SRO) duties, and two were performing reactor operator (RO) duties. From the interviews the team determined their understanding of the Maintenance Rule, how their current duties were impacted by the Maintenance Rule, and their understanding of how availability was tracked by the Rule.

b. Observations and Findings

In general, the operators interviewed understood the philosophy of the Maintenance Rule and their responsibilities associated with the Rule. The operators all believed that they were adequately trained and understood the requirements of the applicable procedures. All operators understood the need to restore equipment to operating condition and minimize SSC unavailability. The operations staff used the risk evaluation portion of the Plan of the Day produced by the planning department to understand the risk-significance of planned activities. Operations sent representatives to participate in the Plan of the Day meetings. Although the individuals interviewed did not have a clear understanding of risk terms used in risk studies, these terms were not in common use at the site. The plant used a plant safety index instead

of risk achievement worth (RAW), risk reduction worth (RRW), or large early release frequency (LERF). The operations staff knew who to contact in the planning department for aid in evaluating risk resulting from emergent equipment problems while other equipment was out-of-service.

The inspector's review of six months of control room logs from both units showed variation in the quality of log entries with respect to the logging of out-of-service times for equipment, but the entries generally showed the status changes of major equipment. Interviews of the operations personnel indicated an understanding of how to measure Maintenance Rule unavailability, but the licensee acknowledged that the LCO times were those that were generally logged, not Maintenance Rule unavailability. This resulted in LCO operability times being generally used for maintenance unavailability times (see Section M1.7 which discusses a procedural weakness relative to how unavailability is determined). The LCO times were available from the LCO log, which had both the beginning and ending times for the LCO. Information LCOs were written for equipment conditions not meeting the need for an LCO but important enough to track the status. The interviews indicated that the operations staff was sensitive to the importance of the logs as a source of information for Maintenance Rule record keeping. A computerized control room logging system was adopted several weeks prior to the inspection, and legibility of the logs made review for equipment status less difficult. The computer appeared to enter the time of the entry automatically, which made determination of equipment out-of-service times dependent on the timeliness of the log entry. The SROs interviewed indicated the unified logs also reduced the redundant entries of the separate RO and SRO logs.

c. Conclusions

Licensed operators, in general, understood their specific duties and responsibilities for implementing the Maintenance Rule.

II. MAINTENANCE

M1 Conduct of Maintenance

M1.1 Scope of Structures, Systems, and Components Included Within the Rule

a. Inspection Scope (62706)

Prior to the onsite inspection, the team reviewed the Vogtle Final Safety Analysis Report (FSAR), Licensee Event Reports (LERs), the Emergency Operating Procedures (EOPs), previous NRC Inspection Reports, and information provided by the licensee. The team selected an independent sample of SSCs that the team believed should be included within the scope of the Rule, which had not been classified as such by the licensee. During the onsite portion of the inspection, the team

used this list to determine if the licensee had adequately identified the SSCs that should be included in the scope of the rule in accordance with 10 CFR 50.65(b).

b. Observations and Findings

The licensee appointed an expert panel to perform several Maintenance Rule implementation functions including establishing the scope of the Maintenance Rule. The panel reviewed 178 plant systems of which 95 were determined to be in the scope of the Rule. Additionally, the panel reviewed 37 plant structures of which 18 were determined to be in the scope of the Rule.

The team reviewed the licensee's Maintenance Rule database in an effort to verify that all required SSCs were included within the scope of the Maintenance Rule. The team's review was performed to assure the scoping process included the following:

- all safety-related SSCs that are relied upon to remain functional during and following design basis events and ensure the integrity of the reactor coolant pressure boundary; the capability to shut down the reactor and maintain it in a safe shutdown condition, and the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the 10 CFR, Part 100 guidelines,
- non-safety SSCs that are relied upon to mitigate accidents or transients,
- non-safety SSCs which are used in the plant emergency operating procedures,
- non-safety SSCs whose failure could prevent safety-related SSCs from fulfilling their safety-related function, and
- non-safety SSCs whose failure could cause a reactor trip or actuation of a safety-related system.

The team reviewed the licensee's database and verified that all required SSCs were included in the Rule. During the review, the team noted that the boron solution mixing function of the chemical volume and control system (CVCS) (System 1208) had not been reviewed for scoping in the Rule. The team concluded that this should not have prevented the licensee from properly evaluating any failures associated with the boron solution mixing portions of System 1208 since that system had already been included in the scope of the Rule. System 1208 had been included in the scope of the Rule due to other functions which had met the criteria for inclusion in the Rule. The licensee issued Plant Action Item C037976 to require assessment of the boron solution mixing function for scoping in the Rule.

c. Conclusions

Required SSCs were included within the scope of the licensee's program.

M1.2 Safety or Risk Determination

a. Inspection Scope (62706)

Paragraph (a)(1) of the Maintenance Rule requires that performance monitoring and goals be commensurate with safety. Implementation of the Maintenance Rule using the guidance contained in NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, requires that safety be taken into account when setting performance criteria and monitoring under (a)(2) of the Maintenance Rule. This safety consideration would then be used to determine if SSC functions be monitored at the train, system, or plant level. Also, Section 9.3.2 of NUMARC 93-01 recommends that risk-significant SSC performance criteria be set to assure that the availability and reliability assumptions used in the risk-determining analysis (i.e., PRA) are maintained. The team reviewed the licensee's methods for making these required safety determinations.

b. Observations and Findings

The Maintenance Rule program at Vogtle had major changes in the months prior to this inspection. The original program was established using the original individual plant examination (IPE) submittal, but the program was transitioning to a PRA model run using a different computer program. Equipment out-of-service risk-determinations had been made using the new code for only several weeks prior to the inspection. The team reviewed expert panel meeting minutes, attended an expert panel meeting, and interviewed some of its members. In addition, interviews were conducted with the PRA specialists.

b.1 Risk-ranking

The licensee's PRA model used for the original ranking process was that of the IPE submitted to the NRC, dated December 1992. The model was a full scope Level 2 analysis, for Unit 1 only, that used generic data and plant specific data gathered from June 1987 through December 1990 as the basis for its availability and reliability data. The plant was modeled to include all design changes implemented through January 1991. Analysis had shown that the differences in the response between Unit 2 and Unit 1 were not great enough to require a separate analysis for Unit 2. Interplant dependencies had been examined for impact on the analysis. The data had not been updated for the Maintenance Rule, so most PRA availability and reliability assumptions were dominated by the industry generic data available prior to 1990. The original PRA was developed using Westinghouse PRA codes and had a core damage frequency (CDF) of 4.9E-5. The licensee recently converted its model to a form which will run using the cutset and fault tree analysis (CAFTA) set of

PRA codes, and this model is used for the equipment out-of-service (EOOS) program used in the planning group's risk evaluations. The CDF in the new model was about 3.6 E-5. Contributing to the differences in the CDFs were changes in the modeling of the Plant Wilson electrical intertie for use in offsite power recovery. The CAFTA model was the basis for risk-ranking, sensitivity studies on the Maintenance Rule performance criteria, and in the daily risk-evaluations performed using EOOS.

The team reviewed the truncation limits used during the risk-ranking process. Truncation limits are imposed on PRA models in order to limit the size and complexity of the results to a manageable level. Vogtle used a truncation level of 1E-11 when quantifying their original PRA. The model was evaluated at E-8 for calculating the risk-ranking RAW and RRW values, and at E-10 for determining the equipment included in the cutsets in the top 90% of the plant's CDF. The truncation level used appeared to be appropriate for use to perform the risk-ranking for the Maintenance Rule.

In the expert panel meetings conducted August 28, and 29, 1997, risk-ranking of the majority of the MR equipment was performed. The expert panel considered a delphi score computed from input from the expert panel, the systems RAW, RRW and the large release RAW (LRRAW). System selection criteria included RAW>2., RRW>1.005, and LRRAW>2. Although not a part of the expert panel, PRA specialists were present at the meeting. Based on this review, the team determined that the licensee's process was adequate to perform the risk-ranking for the Maintenance Rule.

b.2 Performance Criteria

The team reviewed the licensee's performance criteria to determine if the licensee had adequately set performance criteria under (a)(2) of the Maintenance Rule consistent with the assumptions used to establish the safety significance. Section 9.3.2 of NUMARC 93-01 recommends that risk-significant SSC performance criteria be set to assure that the availability and reliability assumptions used in the risk-determining analysis (i.e. PRA) were maintained.

Vogtle obtained estimates of equipment unavailability from the system engineers, based on the normally expected maintenance and surveillances, and set their performance criteria from these estimates. The PRA specialists performed a sensitivity analysis on the PRA results by substituting the performance criteria from the Maintenance Rule into the model. The CDF value increased about 60%, and the LERF increased about 13%. The current method for assuring that the PRA assumptions for unavailability were met was acceptable. If the actual unavailabilities for the next cycle are close to the system engineers estimates, the PRA CDF will increase when the update is performed. Even though the

licensee's emphasis is to miminize all unavailability, the sensitivity study could indicate which systems' increases in unavailability have the greatest impact on the CDF.

The team could not determine that any insights on which systems unavailability were most critical had been passed on to either the expert panel or to planning. These insights would have the potential to decrease risk by focusing resources or additional planning on those systems where a decrease in unavailability is most important.

The system reliability performance criteria were all set at one or in a few cases, at zero maintenance preventible functional failures (MPFFs). A sensitivity analysis had not been performed to determine if these criteria were conserving the assumptions in the PRA. Preliminary calculations performed by the licensee during the inspection showed the fail-to-start and fail-to-run expected values per cycle for most equipment to be less than the performance goal of one. Electric Power Research Institute (EPRI) Technical Bulletins 96-11-01 and 97-03-01 were used to aid in the evaluation. Actual demands were used in the calculation for major equipment, where available, and demands were estimated for generic equipment types. The results had not yet been reviewed by the expert panel by the end of the inspection. The expert panel evaluated failures to systems, and in two cases, had placed systems in (a)(1) just based on a single failure, before the second failure would have required the action. The combination of small amounts of demands, and the conservatism of the expert panel's actions, indicated that the current criteria were acceptable until the PRA specialists can present the reliability sensitivity study's results to the expert panel for evaluation. Additional review of this item will be performed after the reliability sensitivity study is complete and presented to the expert panel for action. This will be tracked by Inspector Followup Item 50-424, 425/98-01-01, Review of Maintenance Rule Reliability Assumptions.

b.3 Expert Panel

The team reviewed the licensee's process and procedures for the expert panel. The licensee had established an expert panel in accordance with the guidance provided in NUMARC 93-01 when the Maintenance Rule was being implemented at the site, with the exception that there was limited PRA expertise present. The expert panel's responsibilities included the final authority for initial decisions regarding Maintenance Rule scope, risk-significance, and performance criteria selection. The expert panel had representation that included operations, maintenance, outages and planning, and engineering. PRA specialists from the Birmingham office are available as a resource and were present at the meeting on August 28 and 29, 1997, when the final approval for most scoping, ranking, and performance criteria were made. The representative from planning has had PRA training, but the PRA specialists had a more detailed knowledge of the plant PRA model.

The team attended an expert panel meeting conducted January 28, 1998. The team noted a good exchange of ideas between the board members and the invited speakers discussing the various issues.

c. Conclusions

The licensee's approach to risk-ranking for the Maintenance Rule was adequate. The current method of assuring that the assumptions for availability in the PRA are conserved was adequate, but the PRA insights from the sensitivity study on availability were missing from the expert panel's discussions. A sensitivity analysis had not been performed to determine if reliability criteria were conserving the assumptions in the PRA, but studies were in progress at the end of the inspection. IFI 50-424,425/98-01-01, was opened to review the expert panel's re-evaluation of the reliability assumptions after the completion of the sensitivity studies.

M1.3 Periodic Evaluation

a. Inspection Scope (62706)

Paragraph (a)(3) of the Maintenance Rule required that performance and condition monitoring activities and associated goals and preventive maintenance activities be evaluated taking into account, where practical, industry-wide operating experience. This evaluation was required to be performed at least one time during each refueling cycle, not to exceed 24 months between evaluations. The team reviewed the licensee's periodic evaluation process.

b. Observations and Findings

At the time of this inspection, the licensee was not required to have completed the first periodic evaluation. The licensee had performed two audits and one self-assessment in the area of 10 CFR 50.65 which are discussed further in Section M7.1 below.

The licensee performed a periodic maintenance assessment covering the period from March 1995 to July 9, 1996. This assessment, completed prior to the implementation of the Rule, did not completely address the topics of NUMARC 93-01, "Industry Guidelines For Monitoring The Effectiveness Of Maintenance at Nuclear Power Plants", Revision 2, Section 12.

The licensee stated that there were plans to complete a periodic maintenance assessment, for both units by June 1, 1998. This assessment was planned to cover at least that portion of Unit 1 fuel cycle seven after the implementation of the Rule (July 10, 1996 to September 19, 1997, and that portion of Unit 2 fuel cycle five after the implementation of the Rule (July 10, 1996 to September 19, 1997), and all of Unit 2 fuel cycle six (September 19, 1997, 1996 to March 9, 1998).

Procedurally, the periodic maintenance assessment was addressed in licensee Procedure 00353-C, "Maintenance Rule Implementation", Revision 4. The procedure guidance for NUMARC 93-01, Sections 12.2.3, "Review of Effectiveness of Corrective Actions" and 12.2.4 "Optimizing Availability and Reliability for SSCs" was vague. The licensee indicated that they planned to cancel Procedure 00353-C and to include the topics discussed therein in a subsequent revision to Procedure 50028-C, "Engineering Maintenance Rule Implementation".

Since the procedural coverage for periodic assessments was vague, and the first periodic assessment had yet to be completed (it was scheduled for June 1998), Inspector Followup Item (IFI) 50-424,425/98-01-02, Maintenance Rule Periodic Assessment, was opened to ensure that the first periodic assessment is reviewed by the NRC.

c. Conclusions

The team concluded that the licensee's plans for performing periodic evaluations and assessments met the requirements of the Maintenance Rule. However, the procedure covering the periodic assessments was vague and did not provide adequate details in the areas of: (1) review of effectiveness of corrective actions, and (2) optimizing availability and reliability for SSCs.

M1.4 Balancing Reliability and Unavailability

a. Inspection Scope (62706)

Paragraph (a)(3) of the Maintenance Rule required that adjustments be made where necessary to ensure that the objective of preventing failures of SSCs through (preventive) maintenance was appropriately balanced against the objective of minimizing unavailability of SSCs due to monitoring or preventive maintenance. The team reviewed the licensee's approach to balancing system reliability and unavailability for risk-significant systems.

b. Observations and Findings

The licensee had scheduled balancing reviews during periodic evaluations at refueling outages, not to exceed 24 months, as specified in NUMARC 93-01. In addition, the licensee's program required the system engineers to perform a balancing review during their monthly evaluation of their systems. The licensee's approach consisted of monitoring SSC performance against the established SSC performance criteria. The process considered a function balanced if the performance criteria were met. The team verified that the performance criteria for all risk-significant SSCs included both reliability and unavailability requirements.

Although licensee personnel understood how to implement balancing reliability and unavailability, procedures provided little detail to

describe the process to be used. The following summarizes the limited procedure requirements.

- Procedure No. 00354-C, Section 3.3, assigned the Manager, Outages And Planning the responsibility for ensuring that availability and reliability considerations of plant components are balanced against the need to perform elective maintenance on those components.

- Procedure No. 00353-C, Section 4.6.e, required that the periodic assessment review the performance of SSCs against their performance criteria and make a determination as to the adequacy of the balance of availability versus reliability due to current maintenance practices.

- Procedure No. 50028-C, Sections 3.3.10 and 4.7.1, required system engineers to conduct a review of the current maintenance program detailing why the current balance of availability and reliability is (or is not) acceptable for maintaining the SSC reliable and available when an SSC is designated (a)(1).

None of the above procedures provided any details on how balancing was to be accomplished. Although balancing as detailed in NUMARC 93-01 guidance is part of the periodic assessment and has not yet been accomplished (see Section M1.3 above), the team considered the procedures to be weak since they did not provide sufficient details to clearly describe the requirements of NUMARC 93-01 for balancing.

c. Conclusions

The team concluded that the licensee's approach to balancing reliability and unavailability met the intent of paragraph (a)(3) of the Rule. However, procedures were weak in that they did not contain sufficient detail to clearly describe the requirements for balancing reliability and unavailability for risk-significant SSCs.

M1.5 Plant Safety Assessments Before Taking Equipment Out-of-Service

a. Inspection Scope (62706)

Paragraph (a)(3) of the Maintenance Rule states that the total impact on plant safety be taken into account before taking equipment out-of-service for monitoring or preventive maintenance. The team reviewed the licensee's procedures and discussed the process with plant operators and the planning department.

b. Observations and Findings

The team interviewed the planning supervisor, and an SRO on rotation from operations, who both performed the risk-evaluations for equipment out-of-service. A PRA computerized tool, EOOS, had been used, starting

about three weeks prior to this inspection, to evaluate risk for various full power plant configurations. EOOS had the CAFTA plant models loaded into it. The model's cutsets for a E-10 truncation formed the basis for the EOOS evaluations. In addition, any unique cutsets generated in the evaluations that were performed at E-8 to generate the systems risk-rankings were added to the cutset file. This resulted in about 120,000 cutsets being used in the calculations. The model was a Level 2 PRA, and LERF and RAW values were generated for each plant condition evaluated. In addition, a plant safety index was generated, which was used by the planners for safety significance evaluations. The plant safety index was generated using the calculated zero maintenance instantaneous CDF and the base case zero maintenance CDF. The output was used to plan future equipment outages, to evaluate the plan of the day, and to evaluate the impact of equipment failures on plant conditions. The EOOS evaluations were performed by persons having a high level of plant knowledge. The NRC inspection documented in Inspection Report 50-425,425/96-10 identified potential weaknesses with Vogtle's process for performing the assessments prior to removing equipment from service. Since that inspection, the EOOS program has been developed for Vogtle, and EOOS evaluations were performed by planning to augment the old method, which used deterministic reviews, and a policy of not having more than one safety system out-of-service at a time. The use of EOOS for determining the risk input for plant equipment out-of-service evaluations was good. Based on the current review, IFI 50-424,425/96-10-04, Adequacy of Licensee's Maintenance Rule Evaluations, is closed.

The team interviewed individuals in the independent safety engineering group (ISEG) who provided outage safety assessments using the outage risk-assessment management (ORAM) computer program about assessment prior to removing SSCs from service during shutdown (Modes 5, 6 and defueled). Outage removal from service decisions are made by outage planning based on other equipment out-of-service, and the availability of systems to meet critical functions. Operations and ISEG provide additional reviews. The ORAM tool used by ISEG has the ability to analyze the downloaded schedule and determine which activities could provide a reduction in safety margin. ISEG used this tool to provide pre-outage assessments to aid in optimizing the outage schedule, and to provide risk-assessments during the outage. A shutdown EOOS model was also being developed using the logic developed for the ORAM program as a basis. The team found the current guidelines to be adequate.

c. Conclusions

The approach, under paragraph (a)(3) of the Rule, to assessing the risk-impact to maintenance activities was good. The licensee's process for ensuring that critical safety functions were available during planned outages was adequate. The overall approach to assessing the risk-impact of maintenance activities was considered adequate.

M1.6 Goal Setting and Monitoring for (a)(1) SSCs

a. Inspection Scope (62706)

Paragraph (a)(1) of the Maintenance Rule required, in part, that licensees shall monitor the performance or condition of SSCs against licensee-established goals, in a manner sufficient to provide reasonable assurance that the SSCs are capable of fulfilling their intended functions. The Maintenance Rule further required that goals be established commensurate with safety and that industry-wide operating experience be taken into account, where practical. Also, when the performance or condition of the SSC did not meet established goals, appropriate corrective action was to be taken.

The team reviewed the systems and components listed below for which the licensee had established goals for monitoring of performance to provide reasonable assurance the system or components were capable of fulfilling their intended function. The team verified that industry-wide operating experience was considered, where practical, that appropriate monitoring was being performed, and that corrective action was taken when SSCs failed to meet goals or when a SSC experienced an MPFF.

The team reviewed program documents and records for four systems or components that the licensee had placed in the (a)(1) category in order to evaluate this area. The team also discussed the program with licensee management, the Maintenance Rule engineer, system engineers, and other licensee personnel.

b. Observations and Findings

b.1 Nuclear Service Cooling Water (NSCW) - System 1202

As a consequence of a pipe leak that resulted from vibration induced high cycle fatigue, which was identified by the licensee on February 21, 1996, and the subsequent repair activities, the Unit 1 NSCW system exceeded the unavailable time performance criteria of 50 hours per train per cycle. Subsequently, the Unit 1 NSCW system was placed in the (a)(1) category. On May 17, 1997, maintenance on the NSCW cooling tower fan caused the NSCW system to exceed the performance criteria of 50 hours per train per cycle. The licensee determined that the 50 hours per train per cycle for the NSCW system with the inclusion of the ultimate heat sink function was overly conservative. Subsequently, the performance criteria was amended to reflect the ultimate heat sink function. In September 19, 1997, the licensee established a performance criteria of 150 hours of unavailability per pump per a rolling 18-month average. As a consequence of a historical review conducted for the newly established performance criteria, NSCW Pumps 1-1202-P4-001 and 1-1202-P4-004 exceeded the newly established performance criteria of 150 hours of unavailability per pump per a rolling 18-month average. In October 1997, NSCW Pump 1-1202-P4-002 entered the Action Required range resulting from an ASME Section XI IWP surveillance and was subsequently

declared inoperable. The unavailable time resulting from that surveillance, combined with the unavailable time identified in the September 19, 1997 historical review caused NSCW Pump 1-1202-P4-002 to exceed the same performance criteria that the two pumps exceeded in the pervious month. The licensee has established corrective actions and goals to address the above reliability failures.

The team reviewed the corrective action for these failures and the goals and monitoring under the (a)(1) status and concluded that the corrective action, goals and monitoring were generally appropriate. The goal for verifying that the corrective action taken to address the pipe leak (pipe replacement with heaver schedule pipe and the installation of additional support) was no leaks for two fuel cycles, with observations made quarterly with the insulation in place. The team considered that interim observations for leaks with the insulation in place was appropriate, but more assurance was needed for the last observation (with no leaks identified) which would move the NSCW system from (a)(1) to (a)(2). The licensee concurred that some form of nondestructive surface examination for cracking was appropriate and initiated Plant Action Item C00037980 to track corrective actions for this issue.

The team also reviewed additional work order data concerning performance of this system for the period June 1995 to the beginning of the inspection. In addition, the team compared periods of unavailability identified by a review of LCO logs and the Unit Logs with the unavailability database for the NSCW system.

b.2 Chemical and Volume Control System (CVCS) - System 1208

Two failures occurred on breakers associated with CVCS components on Unit 1, which the licensee considered as MPFFs. This exceeded the performance criteria of one MPFF and therefore the licensee categorized the CVCS as an (a)(1) system on November 25, 1997. The breaker failures were associated with the boric acid transfer pump and the discharge isolation valve for the A-train centrifugal charging pump.

The licensee experienced repeated leakage on the Unit 2 CVCS positive displacement charging pump, which was the basis for reclassification of the CVCS from an (a)(2) to an (a)(1) system. These outages exceeded the performance criteria of out-of-service time of less than 500 hours per rolling 18 months by 187.13 hours in November 1997 and the CVCS was classified as an (a)(1) system on December 16, 1997.

The team reviewed the corrective actions for failures and the associated goals and monitoring under the (a)(1) status for the CVCS and concluded that the corrective actions, goals, and monitoring were appropriate. Selected areas and components of the CVCS were walked down by the team and system engineer. Overall, material condition and the area housekeeping were considered good. However, system leakage and other minor discrepancies were noted which included boron buildup on the 1B centrifugal charging pump suction line flange and flange bolting. The

system engineer determined that appropriate actions were in progress to address these issues including an evaluation of corrosion conditions of the 1B centrifugal charging pump suction flange bolts. The system engineer was knowledgeable of the Maintenance Rule requirements but less than fully knowledgeable on the CVCS. The lack of system knowledge was attributed to rotation of the system engineer to this system, approximately three months ago. The team concluded that he was aggressive in pursuing system performance issues needed to improve the performance and reliability. Also, he had initiated a review of previous items for the last six months to gather data and to understand the system better.

b.3 Containment Isolation System - System 2415

The containment isolation function of Unit 2 instrument air containment isolation Valve 2-2420-U4-049 had been classified as (a)(1) during October 1997 due to consecutive local leak rate testing (LLRT) failures. The licensee's performance criteria included no consecutive as-found LLRT failures. The valve had failed to satisfy the licensee's LLRT administrative limit during the last two outage periods. The analogous isolation valve on Unit 1 had not experienced the same history of failures. The remaining portions of System 2415 had not been included within the (a)(1) classification and are further discussed in Section M1.7. The licensee had evaluated the problem and determined that a design change was required to improve the leak test performance of the valve. REA 97-VAA133 was issued by the licensee to initiate the design change process. Additionally, for previous LLRT failures, maintenance had been performed to return the affected valves to within required LLRT acceptance criteria prior to restart from the outage. The team verified that the licensee had implemented goal setting and monitoring as required by paragraph (a)(1) of the Rule for the containment isolation system.

b.4 SOLA Transformers

The SOLA transformers (components) were created as a super system of 51 SOLA voltage regulating transformer groups due to a high failure rate and one MPFF. The failures were attributed to a design deficiency. Each SOLA transformer group consisted of two or more voltage regulating transformers connected in parallel. The design deficiency was that two or more SOLA voltage regulating transformers connected in parallel were incompatible. The SOLA voltage regulating transformer operates on the principle of having a resonance circuit. There has been no history of failures when one SOLA transformer is operated by itself. However, when two or more have been operated in parallel, failures occurred due to a miss-match between the resonance circuits in each individual transformer.

The licensee was in the process of implementing plant modifications to replace the SOLA transformer groups with a different design and manufactured by a different vendor. The new design had each transformer

sized to match its load. None of the new transformers were operated in parallel. At the time of this inspection 32 replacement transformers had been installed and operated with no failures. The remaining 19 SOLA transformer groups were scheduled for replacements by the end of 1999.

The (a)(1) performance goal was replacement of all the SOLA transformer groups with no failures of the new voltage regulating transformers during the replacement time period. The team concluded that the performance goal was adequate for removing the SOLA transformer groups from the (a)(1) classification. The performance for the new replacement transformers was also being tracked as components in the systems they were assigned.

The team considered the following licensee corrective actions to be conservative: 1) re-classifying the SOLA transformer groups as (a)(1) even though failures were caused by a design deficiency; 2) replacement of all SOLA transformers, and 3) setting the performance criteria at no failures of the replacement transformers during the modification period. The team found that the corrective actions and goals met the intent of the Rule.

c. Conclusions

The licensee considered safety in establishment of goals and monitoring for the (a)(1) systems and components reviewed. Also, corrective actions, goals, and monitoring were generally adequate for the (a)(1) SSCs reviewed. However, the goal to verify that the NSCW system did not leak at the end of the reckoning period was not totally adequate in that it would not ensure the absence of additional pipe cracking. In general, operating experience was being properly captured, and industry-wide operating experience was considered, as appropriate.

M1.7 Preventive Maintenance and Trending for (a)(2) SSCs

a. Inspection Scope (62706)

Paragraph (a)(2) of the Maintenance Rule states that monitoring as required in paragraph (a)(1) is not required where it has been demonstrated that the performance or condition of an SSC is being effectively controlled through the performance of appropriate preventive maintenance, such that the SSC remains capable of performing its intended function.

The team reviewed selected SSCs listed below for which the licensee had established performance criteria and was trending performance to verify that appropriate preventive maintenance was being performed, such that the SSCs remained capable of performing their intended function. The team verified that industry-wide operating experience was considered, where practical, that appropriate trending was being performed, that safety was considered when performance criteria were established, and that corrective action was taken when SSCs failed to meet performance

criteria, or when an SSC experienced a MPFF.

The team reviewed program documents and records for selected SSCs that the licensee had placed in the (a)(2) category in order to evaluate this area. The team also discussed the program with licensee management, the Maintenance Rule coordinator, engineering and maintenance personnel, and other licensee personnel.

b. Observations and Findings

b.1 Structures

The licensee's program was revised in November 1997 to document a much more detailed structures baseline inspection. At the time of the current NRC inspection, the licensee had completed approximately 50 percent of the more detailed baseline inspection. The licensee planned to complete the baseline inspection by the end of May 1998. The team reviewed "Structural Monitoring Program for the Maintenance Rule", Revision 3, dated December 1997, to evaluate the adequacy of the acceptance criteria and performance criteria for evaluation of concrete and structural steel. The team noted that "Structural Monitoring Program for the Maintenance Rule" did not address roof system ponding and only addressed concrete cracks in terms of width. Crack length was not a consideration. The licensee initiated Plant Action Item C00037982 to evaluate this issue and initiate appropriate corrective actions.

The team conducted a walkdown inspection of structures for which the licensee had completed their structural baseline inspection. These structures included the NSCW cooling towers, reactor auxiliary building and reactor control building in order to observe the condition of the concrete and steel structures located within and without the buildings. The team compared their observations with the structural baseline database and noted the following discrepant conditions which had not been documented by the licensee in the structural baseline database.

- Roof ponding including both diesel generator buildings.[1]
- Long diagonal cracking on the auxiliary building walls.[1]
- Concrete spalling that exceeded the acceptance criteria of "Structural Monitoring Program for the Maintenance Rule".[1]

The team discussed the above with the licensee and indicated that, without detailed baseline information, trending of minor discrepant

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[1] Although these items were not noted in the 1997 Structures Baseline inspection, it could not be determined whether the structural discrepancies existed at the time of the 1997 inspection.

conditions was not possible. The licensee concurred and included corrective action for this issue in Plant Action Item C00037982 noted above.

The team also noted that the structural baseline database indicated that a number of rooms or areas were described as "satisfactory". It was not possible to determine from the database and "Structural Monitoring Program for the Maintenance Rule" what SSCs in those rooms or areas were examined, to what criteria they were inspected, and from what vantage point they were inspected. The licensee concurred and initiated Plant Action Item C00037981 to evaluate and initiate appropriate corrective action for this issue.

The team concluded that the surface cracking and spalling in the concrete structures and the roof ponding discussed above were minor in nature, and the buildings appeared structurally sound. No unacceptable conditions were noted. During the walkdown inspection, the team was accompanied by civil engineers who were knowledgeable and qualified to perform structural evaluations.

As a result of extensive concrete spalling (licensee identified) on the inside surfaces of diesel generator building exhaust missile shield structures, on January 30, 1998, the licensee classified both diesel generator buildings (a)(1).

b.2 Condensate And Feedwater System (CF) - System 1305

Review of the CF system determined that appropriate performance criteria had been established and monitoring was being accomplished against those criteria. Review of the problems associated with the system indicated that appropriate corrective actions had been taken for failures. Operating experience was being used in system monitoring. The team compared periods of unavailability identified by a review of operator logs and clearance logs with the unavailability database for the CF system (see Section 04.1 for details on how unavailability was being logged). Although no problems were identified when comparing unavailability times with those in the database, the team found that program procedures provided minimal details on how unavailability time was to be determined. This was considered to be another area where procedures lacked detail.

b.3 Main Steam System (MS) - System 1301

Review of the MS system for both units revealed that appropriate performance criteria had been established for each of the MS performance monitoring functions with the exception of the main steam dump valves. When questioned by the team the system engineer re-assessed the initial evaluation of these valves. After review, deficiency card #119980037 was issued because the main steam dump valves were included in the scoping of the system but appropriate performance criteria had not been assigned. Work orders, corrective actions, and maintenance records were

reviewed and found to be satisfactory. The team walked down accessible portions of the system and found the material condition was good. Minor items were noted and discussed with the system engineer. System engineer knowledge was very good. The team concluded that he was aggressive in pursuing main steam system performance issues to ensure performance and reliability.

b.4 Essential Chilled Water System - System 1592

Review of the system for both units revealed that appropriate performance criteria had been established for each of the essential chilled water system performance monitoring functions and performance had been monitored against the criteria. Work orders, corrective actions, and maintenance records were reviewed and found to be satisfactory. No deficiencies were noted during the inspection and review of this system.

b.5 Emergency Diesel Generators (EDGs)- System 2403

The team reviewed portions of System 2403 during this inspection. Review of System 2403 determined that appropriate performance criteria had been established and monitoring had been accomplished against those criteria. Additionally, the team verified that the licensee's Maintenance Rule program for the EDGs satisfied the commitments by the licensee in response to 10 CFR 50.63, Loss of All AC Power. Review of the problems associated with the system determined that appropriate corrective actions had been taken for failures. Operating experience had been used in system monitoring. No deficiencies were noted concerning this system.

b.6 Containment Isolation System - System 2415

The team reviewed portions of System 2415 during this inspection. System 2415 included the containment integrity and containment isolation functions associated with all containment penetrations. This included all system piping penetrations, electrical penetrations, fuel transfer penetrations, and access hatches. The various component functions not associated with containment integrity and containment isolation were not considered as part of this system. Those remaining functions such as the capability to provide system flow or electrical power into the containment remained with the various systems that included those containment penetrations.

Review of System 2415 determined that appropriate performance criteria had been established and monitoring had been accomplished against those criteria. However, the team noted that the performance criteria for as-found LLRT failures for System 2415 did not specifically state that it applied to electrical penetrations. The licensee informed the team that this performance criteria had been intended to apply to electrical penetrations in addition to valves, although the wording only mentioned valves. Since no failures of electrical penetration LLRTs had occurred,

there had been no need to apply the performance criteria specifically. The licensee agreed that the wording needed clarification, and Plant Action Item C037983 was issued to address the problem. Review of the problems associated with the system determined that appropriate corrective actions had been taken for failures. Operating experience had been used in system monitoring. No other deficiencies were noted concerning this system.

b.7 Control Building ESF Equipment Room Coolers - System 1532

The team reviewed portions of System 1532 during this inspection. Review of System 1532 determined that appropriate performance criteria had been established, and monitoring had been accomplished against those criteria. Review of the problems associated with the system determined that appropriate corrective actions had been taken for failures. Operating experience had been used in system monitoring. No deficiencies were noted concerning this system.

b.8 Auxiliary Building ESF Room Coolers - System 1555

The team reviewed selected portions of System 1555. The team determined that appropriate performance criteria had been established and monitoring had been accomplished against those criteria. Review of the problems associated with the system determined that appropriate corrective actions had been taken for failures. Operating experience was being used in system monitoring. No deficiencies were noted concerning this system.

b.9 Offsite Power and High-Voltage Switchyard - System 1801

System 1801 was classified as a risk-significant system. Its Maintenance Rule function was to provide power from the main switchyard to each unit's 4160 VAC buses through the train A and train B reserve auxiliary transformers. In addition, it also included the underground power feed from Plant Wilson to the 4160 VAC buses through the standby auxiliary transformer common to both units.

The team determined that appropriate performance criteria had been established for System 1801 and monitoring was being accomplished against those criteria. Based on a review of the system work orders and the plant list of deficiencies, the team verified that the performance criteria were not exceeded and that System 1801 was properly classified as (a)(2). No problems were identified by the team for System 1801.

b.10 4160 VAC Switchgear - System 1804

The Maintenance Rule function of this risk-significant system was to distribute electrical power to the plant 4160 VAC Class 1E and non-Class 1E electrical loads. The system was scoped to include the feeder breakers to the 4160 VAC buses, but not the breakers in the bus cubicles. These breakers were scoped in the systems they provided power

to. For System 1804, the team determined that the performance criteria had been established and monitoring was being accomplished against those criteria. Based on a review of system work orders and the plant list of deficiencies, the team verified the performance criteria was not exceeded and System 1804 was properly classified as (a)(2). No problems were identified with System 1804 by the team.

c. Conclusions

For (a)(2) SSCs, performance criteria had been established; suitable trending had been performed, and corrective actions were taken when SSCs failed to meet performance criteria or experienced failures. Industry-wide operating experience had been considered, where practical, and operating data had been properly captured. A lack of detail was identified in the procedures for structural monitoring and for how unavailability was determined.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Material Condition Walkdowns

a. Inspection Scope (62706)

During the course of the reviews, the team performed walkdowns of selected portions of the following systems and plant areas, and observed the material condition of these SSCs:

- Containment Isolation System - System 2415
- Diesel Generators - System 2403
- Auxiliary Building ESF Room Coolers - System 1555
- Nuclear Service Cooling Water System - System 1202
- Condensate and Feedwater System - System 1305
- Turbine Building
- Cooling Towers
- Reactor Control Building
- Reactor Auxiliary Building
- NSCW Cooling Towers
- Chemical and Volume Control System (CVCS) - System 1208
- Main Steam System - System 1301
- Essential Chilled Water System - System 1592
- Offsite Power and High-Voltage Switchyard - System 1801
- 4160 VAC Switchyard - System 1804
- Other Balance of Plant Areas

b. Observations and Findings

Housekeeping in the general areas around equipment was good. Piping and components were painted, and very few indications of corrosion, oil leaks, or water leaks were evident. Electrical equipment observed was well maintained and in good condition. The 4160 VAC buses and cubicles were exceptionally well maintained.

The team conducted the walkdowns accompanied by the responsible system engineer. In general, the engineers demonstrated a good level of knowledge and familiarity with their assigned system. During the walkdown inspection of SSCs, the team noted the following conditions:

- The team noted carbon deposits on the 1B EDG turbocharger which indicated exhaust leakage. The leakage appeared to be coming from the exhaust manifold rather than the turbocharger; however, the exact location of the leakage could not be determined due to a shroud surrounding the engine exhaust manifold. The team discussed this leak with the assigned system engineer and was informed that the leakage had been previously identified and evaluated by licensee management. The team was further informed that the leakage would be repaired during the next scheduled refueling outage and that the condition was not expected to degrade or effect operability of the EDG based on previous experience with diesel engine exhaust leakage.

- A number of areas of boric acid buildup were noted on valves and flanges in the CVCS system. The worst case was a large accumulation of boric acid on the suction flange and flange bolting of the 1B centrifugal charging pump. This area of buildup had been identified the previous week. Cleaning and evaluation was in progress. The Unit 2 positive displacement pump room was inaccessible due to contamination from various leaks which had caused the Unit 2 CVCS system to be declared (a)(1).

- A number of panel latches were not properly secured - most were in the lower levels of the control building and the auxiliary building.

- A number of exit sign lights were not illuminated.

- PA system speakers were muffled with rags in a number of areas - examples were CVCS pump rooms, boric acid transfer pump room, and main steam valve rooms.

These conditions were identified to the licensee personnel for appropriate corrective actions.

c. Conclusions

In general, plant material condition and housekeeping observed during walkdowns were good. Preservation of equipment by painting was considered to be good.

M7 Quality Assurance in Maintenance Activities

M7.1 Licensee Self-Assessments

a. Inspection Scope (62706)

The team reviewed the licensee's self-assessments and quality assurance audits to determine if the Maintenance Rule independent evaluations had been conducted and the findings of the audits had been addressed.

b. Observations and Findings

The following self-assessment and audits were reviewed:

- Quality Assurance Audit Report OP15-96/03
- 1997 Maintenance Rule Self-Assessment Log: MSV-3363
- SAER Audit of The Maintenance Rule OP15-97/32

Audit Report OP15-96/03, conducted January 29 through February 29, 1996, contained two findings. One was that the monthly engineers's review did not include LCO hours and the other involved tracking and documentation of switchyard maintenance.

The Maintenance Rule Self-Assessment MSV-3363, conducted April 21 through April 25, 1997, contained approximately 15 issues and approximately 20 additional comments. This self-assessment reviewed and compared the actual plant program against the Maintenance Rule. Re-scoping of systems and changes to the program were in progress at the time of the self-assessment.

Audit Report OP15-97/32, conducted November 17 through December 17, 1997, identified two findings. The first finding related to inadequate documentation of basis or justification for (a)(1) system goals. The second finding involved a lack of scoping for the plant computer and plant page. There were also nine recommendations for improvements in the program.

In general, the quality of the audits was good. The assessment was very detailed, addressed Maintenance Rule requirements and related items, identified a number of issues, and made recommendations for improvements to the program. The audits and self-assessments were independent and of appropriate scope. Corrective actions were being taken.

c. Conclusions

Based on the items identified in Audit OP15-97/32 and Self-Assessment 3363, the team concluded that the earlier audit was not as thorough as

it could have been. The last audit was detailed and thorough, but some problems still existed as identified by the team. In general, corrective actions were taken for audit findings.

III. ENGINEERING

E2 Engineering Support of Facilities and Equipment

E2.1 Review of Updated Final Safety Analysis Report (UFSAR) Commitments (62706)

A recent discovery of a licensee operating their facility in a manner contrary to the UFSAR description highlighted the need for a special focused review that compares plant practices, procedures and parameters to the UFSAR descriptions. While performing the inspections discussed in this report, the team reviewed the applicable portions of the Vogtle UFSAR that related to the areas inspected. The team verified that the UFSAR wording was consistent with the observed plant practices, procedures and parameters.

E4 Engineering Staff Knowledge and Performance

E4.1 Engineering Knowledge of the Maintenance Rule

a. Inspection Scope (62706)

The team interviewed licensee system engineers for the SSCs reviewed in paragraphs M1.6 and M1.7 to assess their understanding of the Maintenance Rule and associated responsibilities.

b. Observations and Findings

In general, system engineers were knowledgeable of their systems and proactive in corrective actions. Additionally, they understood specific requirements of the Maintenance Rule and how to apply the Rule to their systems. The design of the licensee's program for implementation of the Maintenance Rule was heavily dependent on systems engineers for implementation. The fact that there existed an effective integration of assigned systems engineers in the process for implementation of the Rule was viewed as a major contributing factor to the program effectiveness noted during this inspection.

During review of the system engineer's Maintenance Rule program responsibilities, the team found that certain decisions made by the system engineers relative to whether an equipment failure was a functional failure, did not receive any other check or overview. Each work request was reviewed for impact on the associated Maintenance Rule system functions. If the system engineer determined that an equipment failure covered by a work request with no associated defiency cards was a functional failure, then a DC was issued and got additional reviews for impact on the Maintenance Rule. However, if the system engineer

determined that the work request issued was part of a scoped function, and it was not a functional failure and had no associated DC, the work request was no longer part of the review process for Maintenance Rule impact. The team considered the lack of a requirement for some independent check or overview of system engineer's decisions relative to work request functional failures to be another example of procedural weakness (see Sections M1.3, M1.4, and M1.7 for additional examples of procedural weaknesses).

c. Conclusions

Generally, system engineers were very knowledgeable of their systems, were proactive in corrective actions, and understood specific requirements of the Maintenance Rule. Effective integration of assigned systems engineers in the process for implementation of the Rule was viewed as a major contributing factor to the program effectiveness noted during this inspection. System engineering contribution to implementation of the Maintenance Rule was considered to be a strength. The lack of check or oversight of the system engineer's decisions relative to functional failure calls was considered to be a procedural weakness.

V. MANAGEMENT MEETINGS

X1 Exit Meeting Summary

The team Leader discussed the progress of the inspection with licensee representatives on a daily basis and presented the results to members of licensee management and staff at the conclusion of the inspection on January 30, 1998. The licensee acknowledged the findings presented.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Beasley, Jr., General Manager, Vogtle
W. Burmeister, Manager, Engineering Support
C. Chastain, Maintenance Rule Coordinator (Alternate)
S. Chesnut, Manager, Operations
B. Clark, Supervisor, SAER
G. Frederick, Assistant General Manager, Support
T. Hargus, Engineering Supervisor
K. Holmes, Manager, Maintenance
D. Minyard, Maintenance Rule Coordinator
C. Tippins, Nuclear Specialist
L. Ward, Engineering and Licensing Manager

NRC

B. Mallett, Acting Deputy Regional Administrator, RII
P. Fredrickson, Branch Chief, Maintenance Branch, DRS, RII

M. Widmann, Resident Inspector
J. Zeiler, Senior Resident Inspector

LIST OF INSPECTION PROCEDURES USED

IP 62706	Maintenance Rule
IP 62002	Inspection of Structures, Passive Components, and Civil Engineering Features a Nuclear Power Plants

ITEMS OPENED, CLOSED, AND DISCUSSED

OPENED

Type	Item Number	Status	Description and Reference
IFI	50-424,425/98-01-01	OPEN	Review of Maintenance Rule Reliability Assumptions - Section M1.3
IFI	50-424,425/98-01-02	OPEN	Maintenance Rule Periodic Assessment - Section M1.5

CLOSED

Type	Item Number	Status	Description and Reference
IFI	50-424,425/96-10-04	CLOSED	Adequacy of Licensee's Maintenance Rule Evaluations - Section M1.2

PARTIAL LIST OF DOCUMENTS REVIEWED

Maintenance Rule Initial Periodic Assessment Period from March 1995 to July 9, 1996

NUMARC 93-01, "Industry Guidelines For Monitoring The Effectiveness Of Maintenance at Nuclear Power Plants", Revision 2

00353-C, "Maintenance Rule Implementation", Revision 4, dated August 3, 1997

50028-C, "Engineering Maintenance Rule Implementation", Revision 6, dated October 28, 1997

"Structural Monitoring Program for the Maintenance Rule", Revision 3, dated December 1997

Vogtle Electric Generating Plant Scoping Manual, Revision 3

Procedure 24965-C, Containment Electrical Penetration Local Leak Rate Test and Charging Instructions, Revision 12

ATTACHMENT A

Vogtle Electric Generating Plant

Maintenance Rule Program

Program Responsibilities

- Engineering Support is responsible for the Maintenance Rule Program
- Outages and Planning is responsible for the Plan of the Day and risk assessments
- Operations and Maintenance are responsible for implementation of the work plan

NUMARC Requirements & Our Organization

- Scoping and Establishing Safety Significance
  - All System Engineers (22), PSA Group, MRC
- Monitoring
  - 22 System Engineers monitor assigned systems
- Evaluating System Removal From Service
  - Central Scheduling
- Periodic Assessment
  - MR Coordinator
- Reporting & Documentation
  - 22 System Engineers and the MR Coordinator
- Expert Panel
  - Operations, Maintenance, Reg Comp, Engineering

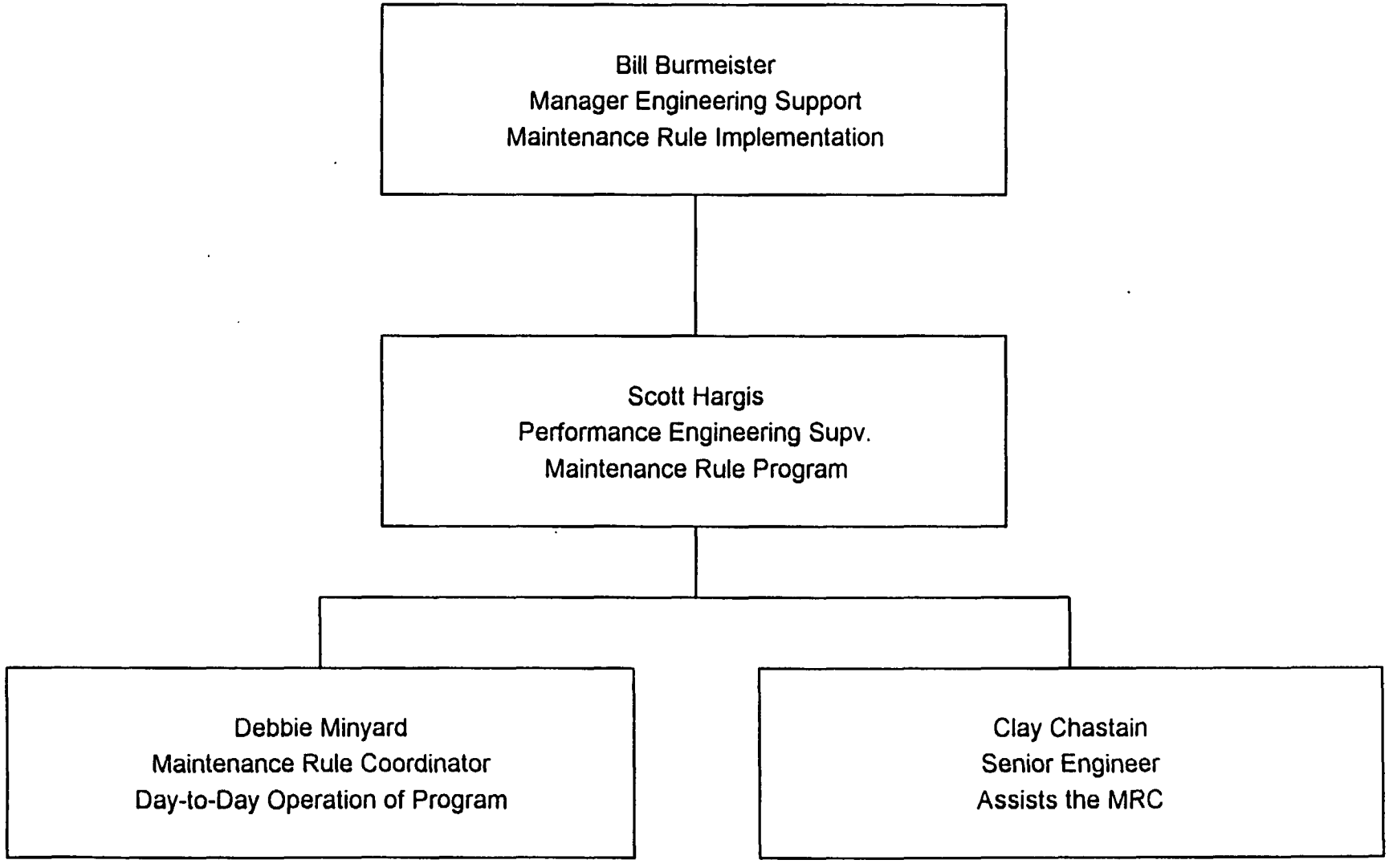
Program Development

- System Engineer Monthly Reporting Began December 1994
- Pilot Inspection Conducted in Jan 1995 with Good Results
- Periodic Assessment Conducted in July of 96

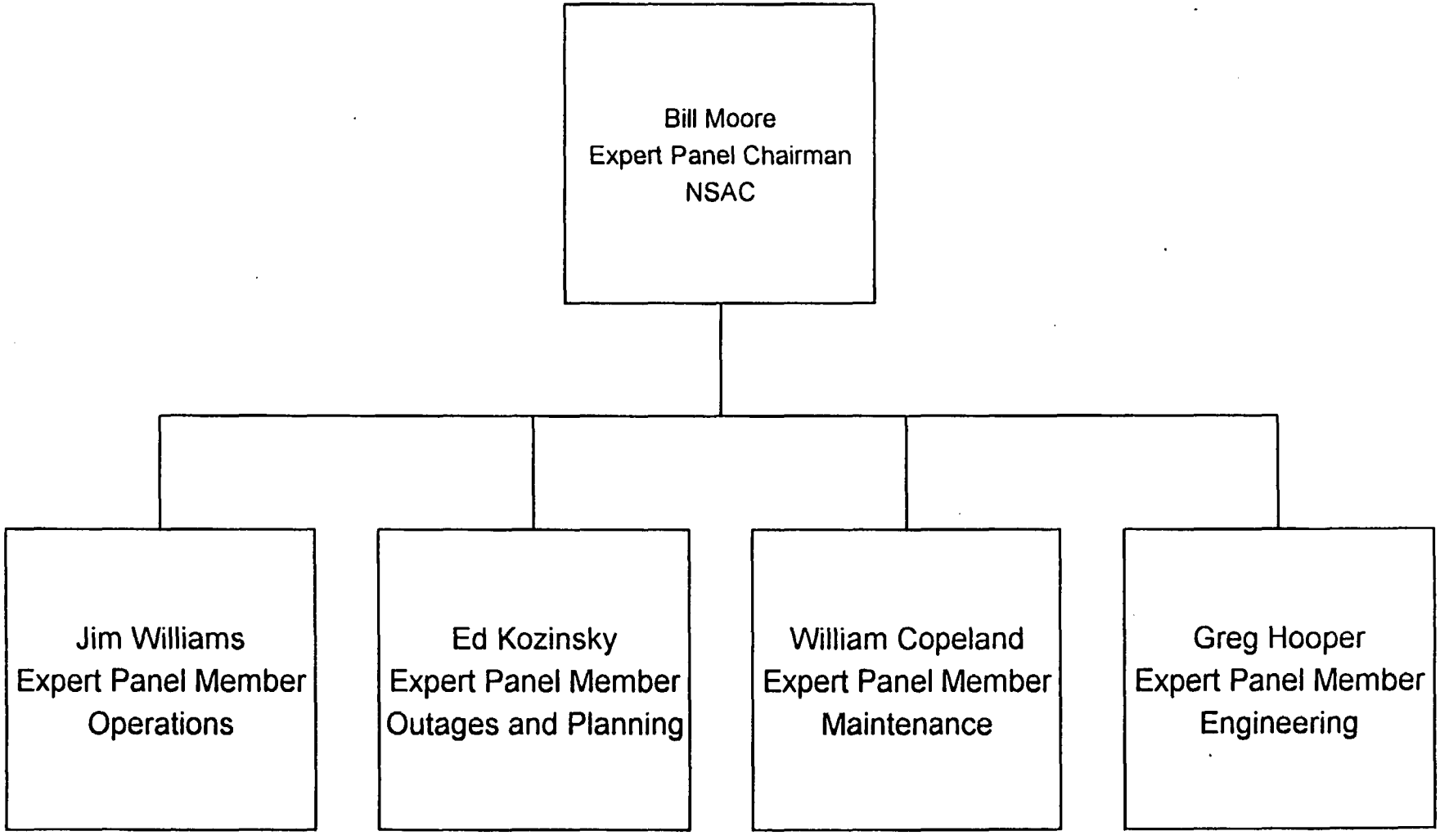
Program Development

- Review of Program Started as a Result of Periodic Assessment and NEI Conference in Nov 96.
  - Changed from System Scoping to Functional
  - Addressed Industry Issues From Previous Inspections
  - Revised PSA to Fault Tree Model
  - Purchased EOOS software for Risk Assessments
  - Safety Significance verified based on new model
  - Performance Criteria validated on new mod

Program Staffing



The Expert Panel



Program Support

- PSA Assessments - Anees Farruk, SNC
- Structural Monitoring - John Davis, SCS
- Corporate Support - Jr Joyner, SNC

VEGP Maintenance Planning

- Planning / Scheduling Philosophy
- Central Scheduling / Maintenance Responsibilities
- Plan of the Day
- Risk Assessment and Management

Scoping Statistics

- 178 Systems
- 95 In-Scope Systems
- 357 Functions
- 189 In-Scope Functions
- 37 Structures
- 18 In-Scope Structures

Current (a)1 Systems

- 1202 - Unit 1 Nuclear Service Cooling Water System
- 1513/Units 1& 2 Hydrogen Recombiner and Monitoring System
- SRMC - Safety-Related Pump Motor Coolers
- SOLA - SOLA Transformers
- 1328 - Unit 1 Main Generator
- 1102 - Unit 1 Nuclear Fuel
- 1808 - Unit 1 Emergency Lighting
- 1808 - Unit 2 Emergency Lighting
- 1208 - Units 1& 2 Chemical Volume and Control
- 2415 - Unit 2 Containment Isolation

Future Program Improvements

- SNC Plants to have Identical MR Programs
- Function Based Performance Criteria
- LAN Based Scoping Manual
- Condition Monitoring Being Implemented
- EPIX Program Near Implemention
- EOOS Software near Full Implementation
- Shutdown Model to Be Developed